DELHI METRO RAIL CORPORATION (DMRC)

CASE **STUDY**

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OVERVIEW

The Delhi Metro is a metro system serving Delhi and its satellite cities of Faridabad, Gurgaon, Noida and Ghaziabad in the National Capital Region of India. Delhi Metro Rail Corporation Limited (DMRC), a state-owned company with equal equity participation from Government of India and Government of Delhi, built and operates the Delhi Metro. It is the second oldest metro in India after Kolkata Metro. Delhi Metro is the world's 12th longest metro system in length and 16th largest in ridership. The network consists of six colour-coded regular lines and the faster Airport Express line, with a total length of 231 kilometres (144 mi) serving 173 stations (including 6 on Airport Express line).

REQUIREMENT

DMRC is India's largest metro system serving over 2.76 million passengers every day and they wanted to offer WiFi access to its commuters by leveraging their existing Cisco network. The challenge was to install and operate a WiFi setup in a very challenging environment. Wifi-soft's UniBox, which offers end-to-end management and security, was deployed in a complex VLAN enabled network. There was also an increased average user throughput and they had to enforced fair usage on each user.

HOW WE HELPED

- Reduced OpEx and CapEx
- Easy tracking of number of users, bandwidth control, policy management and reporting
- Large volume of data to perform consumer behaviour analytics
- Integrated BYOD support
- Simplified and centralized network management
- A reduction in network fault calls
- Ability to remotely control, monitor and troubleshoot
- Ubiquitous Wi-Fi coverage and stronger signal
- The ability to support high density environments with more concurrent users per access point
- Access point Monitoring
- Proximity marketing

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DMRC operates over 3,000 trips daily, with first trains starting at around 05:00 and last at 23:30. In the financial year 2016-17, Delhi Metro had an average daily ridership of 2.76 million passengers and served 100 crore (1.0bn) riders in total during the year.

The Delhi Metro is being built in phases. Phase I completed 58 stations and 65.0 km (40.4 mi) of route length,[28] of which 13.0 km (8.1 mi) is underground and 52.1 km (32.4 mi) surface or elevated. Phase II of the network comprises 124.6 km (77.4 mi) of route length and 85 stations,[28] and is fully completed, with the first section

opened in June 2008 and the last line opened in August 2011. Phase III (103 km, 69 stations) and Phase IV (113.2 km) are planned to be completed by December 2018 and 2022 respectively.

Delhi Metro has been registering a continuous increase in ridership since its inception. When Metro services were introduced in 2002, the average ridership was 80,000 passengers per day. As of FY 2016-17, average daily ridership has risen to 2.76 million, with the latest daily ridership record set on 17 August 2016.

Currently, Delhi Metro has about 220 trains of four, six and eight coaches totalling 1,290 coaches. It is further planning to add 421 more coaches on the existing route before the completion of phase 3. During the financial year 2015, DMRC on an average pressed 1,083 coaches in an hour (during peak hour), in 2012–13, the number was 819. On an average, trains make 3000 trips per day.

Considering the size of the Delhi Metro, it was imperative that the system was designed to handle the traffic requirements and scale of the project. Delhi being a capital and sensitive city, it was important that the WiFi network was highly secure and foolproof. DMRC had to comply with the TRAI regulations which required each user is verified and tracked before accessing the public WiFi. The system had to implement the SMS/OTP login method and also maintained the URL browsing history for each hotspot user. Moreover, the system had to control the bandwidth consumed by each user and ensure that it gets allotted and used fairly so users will have a good Internet experience. Lastly, the system also had to block access to unwanted content and generate reports and analytics for the DMRC IT team.

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DMRC

There were installation and setup challenges as well. DMRC allowed limited access to their data center and gave only 2-3 hour window after midnight to work on the project. So the system had to be installed within minimal configuration and testing.

Indio deployed its award winning UniBox access controller and WiFiLAN OSS/BSS for operating and managing the DMRC WiFi network. Indio networks products were selected because they were reliable, scalable and proven technologies for WiFi hotspots. Indio also had over a decade experience of managing large and complex WiFi installations across the world. Additionally, DMRC and the SI were also looking for a solution that would help them monetize the WiFi network through digital advertisement, promotions and paid content. Wifisoft offered the complete solution that was economical and reliable backed by a team of experienced engineers and WiFi experts.

The diagram below shows the network architecture of the WiFi hotspots.
Each station had multiple WiFi access points deployed at strategic places to provide optimal WiFi coverage. All the APs were connected to the core switch through a MPLS network. The WLC controller was installed in the central data center for managing all the remote access points. The whole network is connected to array of UniBox installed on separate VMs. The UniBox controller is responsible for displaying captive portal, user login and session tracking. All the UniBox controllers work with WiFiLAN OSS/BSS system which is deployed in 1+1 configuration.
The system can be scaled to handle tens of thousands of concurrent logins and serve millions of WiFi users each day.

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DMRC

UniBox provided the following benefits to DMRC

1. Branded Captive Portal: DMRC was able to setup a custom branded captive portal on UniBox.
2. Bandwidth Control: Unibox provided comprehensive bandwidth management and throttling solution to allow fair usage on the network.
3. Legal Compliance: UniBox and WiFiLAN enforced SMS/OTP based login method to comply with the
   TRAI regulations. Additionally UniBox was storing web access logs for each user on the network.
4. Policy Enforcement: WiFiLAN OSS allowed administrators to define various time, bandwidth, speed or client based policies based on the requirements of the network.
5. WiFi Monetization: WiFiLAN OSS/BSS provided multiple monetization methods like online billing,
   vouchers, advertisement, social media marketing, promotions, push notifica tions and more.
6. Reporting & Analytics: UniBox and WiFiLAN had extensive reports for analysing bandwidth Utilization, user tracking, revenue generation and more

Excerpt
https://en.wikipedia.org/wiki/
Delhi_Metro